PYTHON PROJECT- 1 REPORT

Statistical study of the variables

From the pair plot we get, that the variance of Wavelet Transformed image is negatively correlated to the entropy of Wavelet Transformed image and weakly positively correlated to the kurtosis and skewness of the Wavelet Transformed image. We can also observe that the Skewness is highly negatively correlated to the kurtosis of Wavelet Transformed image. This was concluded from the pair plot when the clusters moved from bottom left to the top right, they are positively correlated and when they move from bottom right to top left, then they are negatively correlated. The high relativity with the class is obtained for the kurtosis of the Wavelet Transformed image. But the overall observation is that all the variables play an important role in detecting if the currency is genuine since there is not much of a significant correlation between just one variable and the predictor.

Accuracy of the Machine Learning Algorithms

The following ML algorithms were used, and their accuracy are as follows:

Algorithm	**Train Accuracy**	**Test Accuracy**
Perceptron	95.26	94.54
Logistic Regression	98.90	99.27
SVM	100	100
Decision Tree Learning	100	97.81
Random Forest	100	99.27
KNN	100	100

From the above table, it is clear that using SVM will yield an accurate result. Since the random states are specified, all the algorithms will return the same accuracy except for the KNN classifier, which will return different accuracy for different numbers of neighbours. The most efficient algorithm to solve this problem will be an algorithm with the least false negatives. Here, since SVM has an accuracy of 100%, it means that it has no false negatives and hence is the best algorithm to solve the problem, with KNN and random forest being close equivalents to solve the problem.